

# New record of blue swimming crab *Callinectes sapidus* Rathbun, 1896 (Crustacea: Portunidae) for the state of Rio Grande do Norte, Northeastern Brazil

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**ABSTRACT:** The species *Callinectes sapidus* is reported for the first time in the state of Rio Grande do Norte, Northeastern Brazil. In Brazil, this species is only known from the state of Rio Grande do Sul to the state of Paraíba. In this work, one more gap about the distribution of this species was discovered. Samplings were gathered in two localities: Cavalos River and Ceará-mirim River, north and east coast of Rio Grande do Norte, respectively. This new record increases information about the singular distribution of this species, known for being the only species of *Callinectes* with disjoint distribution in the Americas.

The Family Portunidae Rafinesque, 1815 is represented by eight genera along the Brazilian coast, in which there are twenty one species (Melo 1996). They have great importance in the worldwide recreational and commercial fishing (Millikin and Williams 1984; Botelho *et al.* 2005), mainly the representatives of the subfamily Portuninae, whose main genus is *Callinectes* Stimpson, 1860 (Ng *et al.* 2008). This genus is widely distributed along the coast of the American continent (Williams 1974; 1984; Melo 1996), and in diversity studies made in the state of Rio Grande do Norte, the following species were reported: *Callinectes affinis* Fausto Filho, 1980; *C. bocourti* A. Milne-Edwards, 1879; *Callinectes danae* Smith, 1869; *C. exasperatus* (Gerstaecker, 1856); *C. marginatus* (A. Milne-Edwards, 1861) and *C. ornatus* Ordway, 1863; (Sankarankutty *et al.* 1991; 1999; Robles *et al.*, 2007; Coelho *et al.*, 2008). Despite the great number of published papers about ecological aspects of this genus along the Brazilian coast, no records of ecological studies conducted in Rio Grande do Norte were founded until the finishing of this paper.

One of the most important crabs to the fishing activity is *Callinectes sapidus* Rathbun, 1896, found among the bycatch in many fisheries, especially shrimp ones (Branco and Fracasso 2004; Botelho *et al.* 2005). The same authors asserted that, in Brazil, *C. sapidus* is one of the Portunidae species captured by low income riverine populations, who use them as their livelihood or food supplement for their families.

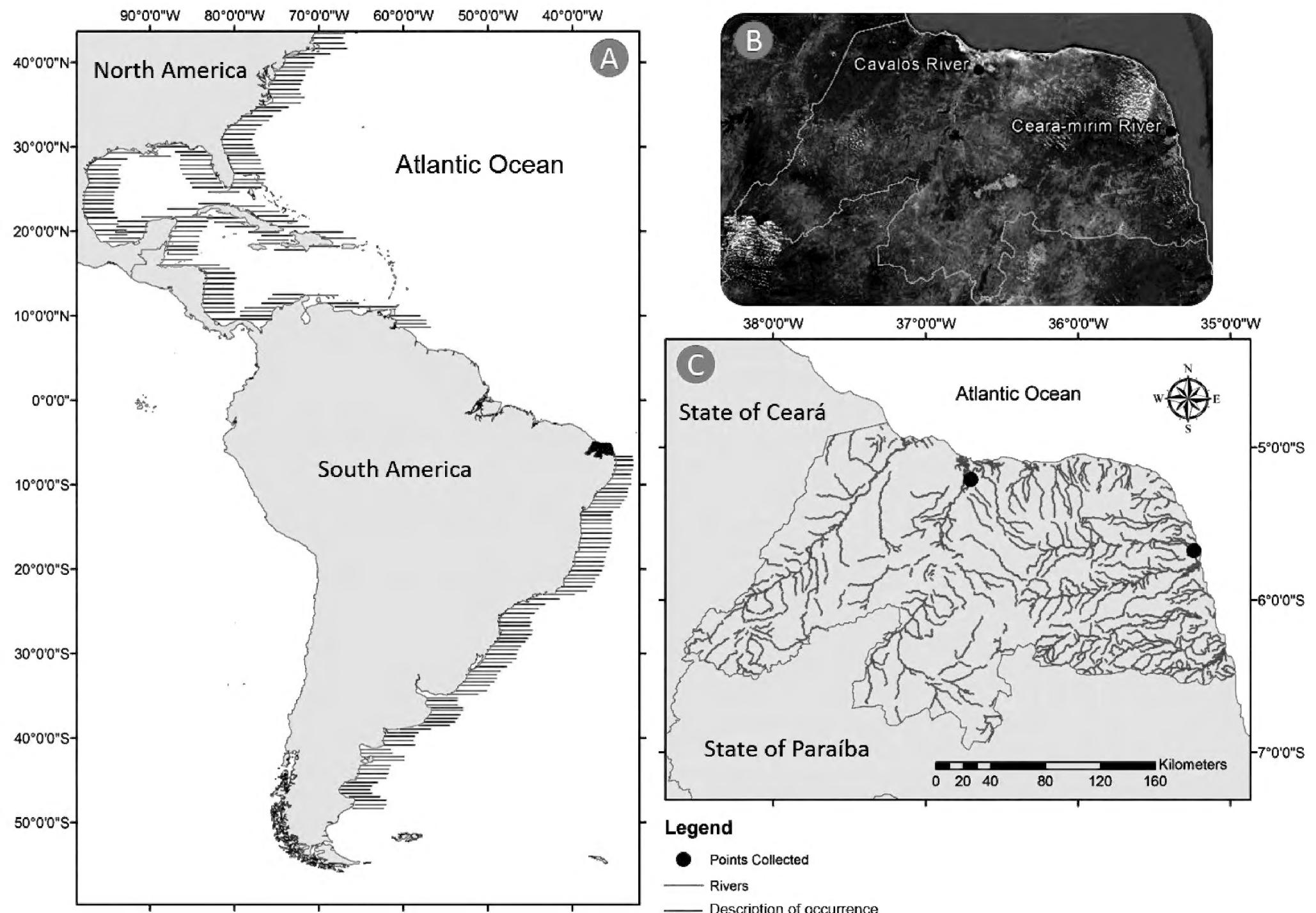
The species *C. sapidus*, commonly known as “blue swimming crab”, has a wide geographical distribution, being found in the Western Atlantic all along the United States’ Eastern coast, in Central America, in Venezuela and in parts of Brazil and Argentina (Williams 1974; 1984; Melo 1996). According to Melo (1996) and Nehring (2012), this species is also found as an invasive species in the Indo-Pacific region (Japan) and in the Eastern Atlantic

in North Sea, Mediterranean Sea, Adriatic Sea and Black Sea. In addition, this is the only species of its genus which, apparently, presents a disjoint distribution pattern for the Western Atlantic, according to literature records: reports show occurrence in coastal regions from the United States to Venezuela, northern coast of South America and also along the southern South American coast, with occasional records in the states of Pernambuco and Alagoas, and a continuous band from the state of Bahia to Argentina (Williams 1974; Pereira-Barros 1981; Coelho and Santos 2004; Santos and D’Incao 2004). Recently, Rosa (2013) added a new record for *C. sapidus*, filling a gap in the distribution of the southern portion of South America (Alagoas to Bahia), in the Brazilian state of Sergipe, in the upper estuary of the Rio Sergipe. Previously, Ferreira *et al.* (2011) recorded the occurrence of *C. sapidus* in Mamanguape River estuary, in the state of Paraíba, about 100 km of the known distribution for the southern Atlantic portion. This would suggest an extension of the species’ current reported distribution (Figure 1A). To this end, the objective of the present paper was to verify the occurrence of *C. sapidus* in Rio Grande do Norte coast.

The monthly samplings were performed between April and November 2012. The *C. sapidus* specimens were sampled at two sites in the coast of the state of Rio Grande do Norte: at Ceará-mirim River bay (Ceará-mirim river mouth: 5°40'32" S, 35°13'4" W) and at Piranhas-Açú bay (next to the upper region of Cavalos River course: 5°12'26" S, 36°42'8" W) (Figures 1B, C).

Trawl and flue were used for the samplings. Posteriorly, the caught crabs were packed in individual plastic bags, which were labeled and stored inside a freezer at a temperature of 0°C for posterior identification and sexing.

The crabs were identified according to Williams (1974; 1984), by observing the shape, length and presence of bristles in the first pair of pleopods (gonopodium) for the



**FIGURE 1.** (A) – Geographic distribution of *Callinectes sapidus* in the western Atlantic Ocean (red lines = records from the published literature; circles = new record from the state of Rio Grande do Norte). (B) - Satellite image showing the sampling location, Cavalos and Ceará-mirim Rivers – from Google Earth 2012. (C) – Map of the state of Rio Grande do Norte, Brazil, indicating the sampling location.

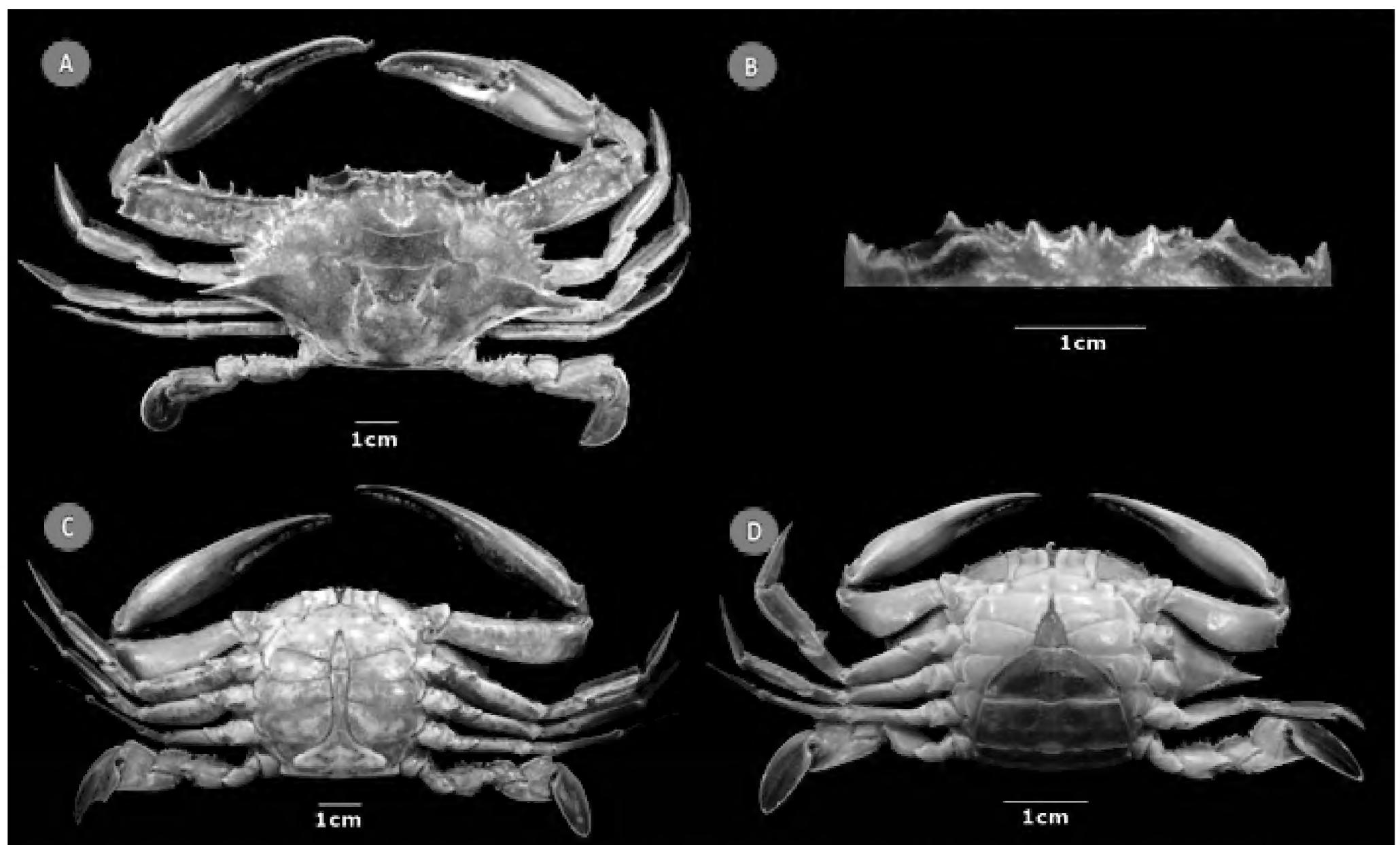
males, and by observing the shape of the gonopores for the females. Secondarily, the identifications were corroborated by observation of characters on the dorsal cephalothorax, anterolateral spines and frontal cephalothorax, following proposed recommendations by Williams (1984). The sexing was made by observing the shape of the abdomen: shape of a inverted "T" for males, triangular for prepuberal females and semicircular adult females (Williams 1974; 1984).

From each crab, six morphometric variables of the dorsal and frontal cephalothorax and of the abdomen region were taken, based on identification bibliography (Williams 1984) and in order to register the most common morphological characters found in literature of studies with *C. sapidus*. The variables used were: distance between the first and the penultimate anterolateral spine (DAS); distance between the frontal spines (DFS); distance between the submedial spines (DSS); distance between the edges of the carapace, excluding the lateral spine (DC); distance between the anterior margins, between the submesial spines and posterior margin of the carapace (DAPC); distance between the lateral margins of the fifth abdominal somite (DAB).

A total of 138 specimens were sampled in the present study. On the Ceará-mirim River site, 25 specimens were sampled (being 16 males and 9 females) and on the Cavalos River estuary site, 113 specimens were sampled (being 110 males and 3 females) (Figure 2A-D), the largest

specimens being found on the latter (Table 1). Individuals were stored in the scientific collection of the Universidade Federal do Rio Grande do Norte (Voucher number GEEFAA/UFRN-001, specimens sampled in Cavalos River, and GEEFAA/UFRN-002, specimens sampled in Ceará-mirim River). The values of measurements obtained in the present study were next to those found in the literature (Hines *et al.* 1987; Atar and Seçer 2003; Ferreira and D'Incao 2008; Pereira *et al.* 2009).

New occurrences were verified to the east and north of Rio Grande do Norte state, regions that comprise, respectively, to below and north of the South American continent. According to Alves *et al.* (2012), the distribution of marine macrobenthic crustaceans is affected by the Guiana Current and the Brazil Current, which originates from the bifurcation of the South Equatorial Current right at Rio Grande do Norte coast, on the very corner of the continent. In addition, it could be a probably co-occurrence of *C. sapidus* with the species *C. bocourti*, as already discussed in the literature (Williams 1984), given that, in the samplings made for this work, specimens of *C. bocourti* were captured in the same locations that *C. sapidus* were collected. This result points to one more possible condition of occurrence for this species in the sampled locations, but a larger sampling effort is still needed to better understand the distribution of *C. sapidus*. This paper may suggest an enlargement of the distribution of this species to the northeastern coast of South America.



**FIGURE 2.** *Callinectes sapidus*. (A) – Male, dorsal view. (B) - View of the frontal and submesial teeth, used in the identification (Williams, 1974; 1984). (C) – Male, ventral view. (D) – Female, ventral view.

**TABLE 1.** *Callinectes sapidus*. Measurements from the specimens for Ceará-mirim and Cavalos Rivers, state of Rio Grande do Norte, Brazil.

VARIABLES	STATISTIC	CEARÁ-MIRIM RIVER		CAVALOS RIVER	
		M	F	M	F
DAS	Max	4.41	3.88	5.32	4.54
	Min	2.60	2.93	3.20	3.94
	Mean	3.49	3.58	4.39	4.24
	S.D.	0.54	1.08	0.49	0.30
DFS	Max	1.33	1.35	1.59	1.30
	Min	0.92	0.98	1.11	1.30
	Mean	1.11	1.16	1.38	1.30
	S.D.	0.13	0.36	0.12	0
DSS	Max	0.48	0.43	0.48	0.43
	Min	0.29	0.33	0.35	0.39
	Mean	0.37	0.38	0.43	0.41
	S.D.	0.05	0.11	0.05	0.02
DC	Max	11.24	9.94	13.04	11.92
	Min	6.89	7.79	8.77	10.14
	Mean	9.01	9.25	11.14	11.03
	S.D.	1.28	2.76	1.11	0.89
DAPC	Max	6.59	6.02	7.74	7.09
	Min	4.10	4.59	5.40	6.13
	Mean	5.38	5.48	6.63	6.61
	S.D.	0.74	1.66	0.63	0.48
DAB	Max	-	4.27	-	4.33
	Min	-	2.96	-	3.76
	Mean	-	3.71	-	4.05
	S.D.	-	1.08	-	0.29

Note: (M) – Male. (F) – Female. (Max) – Maximum. (Min) – Minimum. (S.D.) – Standard deviation. See main text for morphometric variables descriptions.

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